SHOWCASE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of a U.S. provisional patent application No. U.S. 62/199,373 filed on Jul. 31, 2015, in the U.S. Patent and Trademark Office and priority from Korean Patent Application No. 10-2015-0120221 filed on Aug. 26, 2015, in the Korean Intellectual Property Office, the disclosures of which are incorporated hereby incorporated by reference in their entireties.

BACKGROUND

[0002] 1. Field

[0003] Apparatuses consistent with exemplary embodiments relate to a showcase used to display a product.

[0004] 2. Description of the Related Art

[0005] Generally, showcases are used to display various objects for exhibition.

[0006] The showcase includes a housing in which an object is displayed, a transparent plate, such as a tempered glass, configured to cover a front of the housing, and a light source for generating light. The showcase is used to protect the object from the external environment as well as illuminate the object with light to improve viewing of the object within the showcase

[0007] Among showcases, there is a showcase having a display panel, such as a liquid crystal display (LCD) panel, arranged in place of the transparent plate to display an image.

SUMMARY

[0008] Aspects of the exemplary embodiments provide a showcase having an improved structure.

[0009] In accordance with an aspect of an exemplary embodiment, this is provided a showcase including a display module and a housing. The display module includes a light guide plate comprising a plurality of prism grooves having triangular shape disposed on the front surface of the light guide plate and a light source configured to emit light into the light guide plate. The housing includes a reflector. At least a portion of light generated by the light source is reflected by the prism grooves to emit through a rear surface of the light guide plate to the showing space and the portion of light is reflected back to the light guide plate by the reflector.

[0010] The display module comprises a pair of light sources corresponding to the left and right sides of the light guide plate, and each of the prism grooves has a form of an isosceles triangle, and two oblique sides of the isosceles triangle correspond to the left and right sides of the light guide plate.

[0011] Each of the prism grooves may have a vertical angle ranged from 80 to 140 degrees.

[0012] The oblique sides of the prism groove may be formed to be about 50 μm or less long.

[0013] The light source may include a substrate extending to correspond to a side of the light guide plate, and a plurality of light emitting diodes (LEDs) arranged on the substrate.

[0014] Sizes of the prism grooves increase with the distance from the light source.

[0015] Quantity of the prism grooves increase with the distance from the light source.

[0016] The showcase may further include a display panel arranged in front of the light guide plate.

[0017] The portion of the light reflected back to the light guiding plate illuminates the display panel.

[0018] The display module may include a middle mold configured to support the display panel, a front chassis combined onto the front side of the middle mold configured to support the display panel installed in the middle mold, and a rear chassis combined onto the rear side of the middle mold configured to maintain the light guide plate and the light source, and the middle mold, front chassis, and rear chassis may each be formed in the form of a rectangular ring to pass light.

[0019] The showcase may further include a stand, located inside the showing space, configured to support an object to be displayed.

[0020] In accordance with an aspect of an exemplary embodiment, this is provided a display module including a light guide plate comprising a plurality of prism grooves having triangular shape disposed on the front surface of the light guide plate; and a light source configured to emit light into the light guide plate; wherein at least a portion of light generated by the light source is reflected by the prism grooves to emit through a rear surface of the light guide plate.

[0021] The display module may further include a display panel positioned in front of the light guiding plate.

[0022] At least another portion of light generated by the light source emits through the front surface of the light guiding plate to illuminate the display panel.

[0023] Other aspects, advantages, and salient features of the disclosure will become apparent to those skilled in the art from the following detailed description, which, taken in conjunction with the annexed drawings, discloses exemplary embodiments of the disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] The above and other aspects of the present disclosure will become more apparent by describing in detail exemplary embodiments thereof with reference to the attached drawings in which:

[0025] FIG. **1** is a perspective view of a showcase, according to an exemplary embodiment;

[0026] FIG. **2** is a cross-sectional view of a showcase, according to an exemplary embodiment;

[0027] FIG. **3** is an exploded view of a showcase, according to an exemplary embodiment;

[0028] FIG. **4** is a cross-sectional view of a display module of a showcase, according to an exemplary embodiment;

[0029] FIG. **5** shows cross-sectional views of a display guide plate and a light source of a showcase, according to an exemplary embodiment;

[0030] FIG. **6** is a cross-sectional view of a display guide plate and a light source of a showcase, according to an exemplary embodiment;

[0031] FIG. **7** is a cross-sectional view of a display guide plate and a light source of a showcase, according to an exemplary embodiment; and

[0032] FIG. **8** is a perspective view of a showcase, according to an exemplary embodiment.